of *Schmaltzia* of Small) was perfectly differentiated. More than this, true *Schmaltzia* is also represented at Florissant; the species being *Schmaltzia vexans* (*Rhus vexans*, Lesq., *l. c.*, 195); and, says Lesquereux, this also scarcely differs from living forms. The fact that these groups were wholly separated so long ago, indicates that Greene is right in regarding them as different genera, and that Dr. Small should not be followed in uniting them under *Schmaltzia*. The Florissant flora also contains a *Cotinus*, namely *Cotinus fraterna* (*Rhus fraterna*, Lesq., *l. c.*, 192), closely allied to the *Cotinus Palacocotinus* (*Rhus Palacocotinus* Saporta) and *C. cotinus*, of Europe, the first being fossil, the other living.

When we consider the transformations undergone by the vertebrates since these venerable plants flourished, we cannot help feeling impressed with the permanence of types existing among not merely the lower plants, but the higher as well. It would seem that in estimating genera, such facts should count for something; and we should not be guided quite so much by the presence of conspicuous outward marks.

Boulder, Colorado.

PROCEEDINGS OF THE CLUB

November 29, 1905

This meeting was held at the New York Botanical Garden, with Vice-president Underwood in the chair. Twenty persons were present.

Dr. D. S. Martin exhibited specimens of glassy cinders formed by the burning of masses of rice-hulls near Charleston, South Carolina, illustrating in a striking manner the presence of silica in these hulls.

The announced paper of the afternoon was by Dr. N. L. Britton, under the title of "The North American Cactaceae." The speaker remarked that the Cactaceae of North America were being carefully studied by himself in coöperation with Dr. J. N. Rose, of Washington, in anticipation of preparing a systematic account of this group for the "North American Flora." The Mexican forms have been extensively collected by Dr. Rose and

are being kept under cultivation in Washington and New York. Numerous species from Arizona, New Mexico, Lower California and the West Indies have been secured by expeditions sent out by the New York Botanical Garden and now are under cultivation in New York. Herbarium material is, as a rule, peculiarly inadequate to a proper appreciation of the relationships of the members of this family and it is hoped soon to have all of the North American species under observation in the living state. Herbarium specimens are being supplemented by photographs and by material preserved in fluids.

The most recent of the more important papers on the classification of the Cactaceae is one by Berger, entitled "A Systematic Revision of the Genus *Cereus* Mill." and published in the Sixteenth Report of the Missouri Botanical Garden (1905). This paper has been based chiefly on the studies made in Sir Thomas Hanbury's famous gardens in Italy, and gives much importance to characters of flowers and fruit, characters which have been largely ignored in previous schemes of classification because unknown. The genus *Cereus* is divided into eighteen subgenera by Berger. The studies of the speaker and of Dr. Rose indicate that both in the old genus *Cereus* and in other groups of the cactus family, well-marked differential characters of flower and fruit are coördinated with those of the stem in such a way as to make the recognition of several new genera natural and convenient. After these introductory remarks, the meeting was adjourned to the propagating houses of the Garden, where numerous living specimens of Cactaceae were demonstrated and commented upon. Of the genus *Cereus* in the current sense, various types representing subgenera or possible generic segregates were discussed. Among these were *Cereus peruvianus*, the proper type of the genus *Cereus;* species of the *Pilocereus* group, with which the older *Cephalocereus* is historically identical; *Cereus Schottii* of Berger's subgenus *Lophocereus;* *Cereus geometrizans*, representing Console's genus *Myrtillocactus;* *Cereus Pringlei* of Berger's group *Pachycereus;* *Cereus sonorensis*, representing *Stenocereus*, also of Berger; *Cereus triangularis*, a species much cultivated in the West Indies and southern Florida,

with large, beautiful nocturnal flowers, a member of Berger's subgenus *Hylocereus ; Cereus grandiflorus*, the best-known night-bloomer, belonging in Berger's subsection *Selenicereus ;* the curious *Cereus Greggii* with slender stem and very large tuberous subterranean part, representing the subsection *Peniocereus* of Berger ; the Central American *Cereus baxaniensis* of the group *Acanthocereus ;* the Costa Rican *Cereus Gonzalezii*, of Berger's subgenus *Leptocereus ;* and also representatives of Engelmann's subgenus *Echinocereus*. Other specimens were exhibited to illustrate the genera *Phyllocactus*, *Epiphyllum*, *Cactus*, *Echinocactus*, *Melocactus*, *Ariocarpus*, *Pelecyphora*, *Rhipsalis*, *Opuntia*, *Nopalea*, and the curious *Pereskia*, with its leafy, vine-like or shrubby stems.

Adjournment followed.

MARSHALL A. HOWE,
Secretary pro tem.

DECEMBER 12, 1905

This meeting was held at the American Museum of Natural History, with President Rusby in the chair. Thirty-four persons were present.

The following three persons were elected to active membership : Dr. Manuel Gomez de la Maza, Director del Jardin Botanico, Havana, Cuba ; Mr. Henry Allan Gleason, 211 West 108th St., New York City ; Mr. Stafford C. Edwards, New Brighton, Staten Island.

The announced paper of the evening was by Dr. Henry Kraemer and was entitled "Some Studies on Color in Plants and the artificial Coloring of Flowers." The subject of color in plants was considered first from a morphological and chemical point of view, and the speaker performed various illustrative chemical experiments involving changes of color in liquid media. The results of numerous experiments on the control of color in living plants and on the artificial coloring of cut flowers were given. Dr. Kraemer's paper will be published in full in the *Bulletin* of the Club. The following is his abstract of the more important results of his observations and experiments :

"1. Unorganized or cell-sap color substances are distributed

usually in largest amount at the termini of the branches, as in flowers and terminal leaves, or in roots, or in both tops and roots. Their occurrence in those portions of the plant, which are young and growing, points to the conclusion that they are not to be disregarded in the study of metabolic processes. Goebel holds a similar view. He says that it is 'very probable that the feature of color which so often appears when the propagative organs are being brought forth has some connection with definite metabolic processes, although till now we cannot recognize what these are.'

"2. The distribution of the so-called flower color substances in other parts of the plant than the flower also points to the same conclusion, and that the part which they play in attracting insects to flowers, is, if indeed they have any function of this kind, incidental rather than fundamental. The fact that certain colored flowers, as in the spruce and red maple of early spring, are pollinated by the wind, would tend to confirm this view. The food in the nectar and pollen are no doubt sufficient attraction for insects and other animals.

"3. The occurrence of chromoplastids in a reserve organ, as in the tuberous root of the carrot, and the similar occurrence of chromoplastids and of reserve starch in the petals of the buttercup, lead to the inference that the petal of the buttercup, like the root of the carrot, has the function of storing nutrient material. In each case cells containing chromoplasts rich in nitrogenous substances are associated with cells containing reserve materials. In the case of the carrot the reserve materials are utilized by the plant of the second year, and in the case of the buttercup they are utilized in the development of the akene.

"4. The feeding of plants with chemicals for the purpose of controlling color, as certain iron, aluminum, potassium and other salts as well as certain organic acids, has not so far, in the author's experiments with carnations, roses and violets produced any marked changes in the colors of the flowers, only some slight effects being noted which might be attributed to other causes. Knowing that plants have a certain individuality and certain inherent qualties or tendencies, other than negative results could hardly be expected. On the other hand, the plant

is a rather plastic organism, and for this reason experiments along the line indicated are more or less justified.

"5. Experiments in supplying plants and cut flowers with vegetable coloring matters and aniline dyes showed that none of the vegetable color substances were taken up and that only a comparatively few of the aniline dyes would color flowers. The fact that of thousands of dyes or color substances, only a few are carried as high as the flower, would tend to show that only certain chemicals or substances would be taken up by the plant, and thus exert an influence on the coloring matter in the flower. If such profound changes occur in plants as are provided by the mutation theory, is it too much to suppose that certain definite changes might be produced by means of which we have knowledge or control?"

Dr. Kraemer's remarks were illustrated by a hundred or more freshly cut flowers such as carnations, roses, hyacinths, and callas, which had been artificially colored in the few hours preceding the demonstration by placing the stalks of the flowers in solutions of certain dyes. Numerous dried specimens of artifically colored flowers of various plants were also exhibited.

Dr. Rusby showed fresh fruits of the so-called "tree-tomato," a species of *Cyphomandra* native to South America.

Adjournment followed.

MARSHALL A. HOWE,
Secretary pro tem.

NEWS ITEMS

Dr. George T. Moore will have charge of the botanical department of the Marine Biological Laboratory at Woods Hole, Massachusetts, during the coming summer.

It is stated in a recent number of *Science* that Professor Roland Thaxter, of Harvard University, has a year's leave of absence, during which he will make botanical collections in South America.

Professor J. C. Arthur and Mr. Frank D. Kern of Purdue University, Lafayette, Indiana, are spending three weeks or more at the New York Botanical Garden, engaged in studies on the North American Uredinales.